UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,099	09/25/2003	William R. Hancock	H0005180 (256.157US1)	6350

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EXAMINER
RICHER, AARON M

ART UNIT	PAPER NUMBER
2628	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/671,099	HANCOCK, WILLIAM R.
	Examiner	Art Unit	
	AARON M. RICHER	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 May 2008</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>13-20,50 and 51</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>13-20 and 51</u> is/are rejected.

7)☒ Claim(s) <u>50</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed May 27, 2008 have been fully considered but they are

not persuasive. Applicant's arguments with respect to claims 13-20 have been

considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 13, 14, 17-20 and 51 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Fisher (U.S. Patent 6,621,451) in view of Michail (U.S. Publication

2004/0263516) and further in view of Obata (U.S. Patent 5,335,319) and Ikedo (U.S.

Patent 5,900,881).

4.   As to claim 13, Fisher discloses a computer implemented method of representing

an arc (col. 6, lines 1-45; figs. 4d and 4e), the method comprising:

        selecting multiple vertices of the arc (fig. 4d; col. 4, lines 24-40; col. 6, lines 34-

45);

        obtaining trapezoids corresponding to the vertices (col. 2, line 65-col. 3, line 5;

col. 5, lines 45-65; col. 6, lines 36-45; fig. 4e; radial divisions are shown intersecting

range bins, forming range bin sets that are trapezoidal);

obtaining a texture having multiple columns of texels (col. 3, lines 25-35; col. 4, lines 1-6; regular textures are stored in rectangular format in texture memory; these textures are obtained by the processor as necessary as in col. 7, lines 15-20 and col. 8, lines 40-50).

Fisher does not explicitly disclose representing the trapezoids as triangles and mapping the texture to the triangles, but this is taught by Michail (fig. 9; trapezoid 523 is represented as triangles 900 and 902; also see sections 0057-0058, 0062, 0065, and 0069). It would have been obvious to one of ordinary skill in the art to modify Fisher in view of Michail to break trapezoids into triangles in order to accommodate situations involving uneven edge slopes (section 0058) and rendering problems (sections 0062, 0065, 0068, 0072) which is an issue not expressly addressed by Fisher in the mapping of the rectangular textures to the image.

Neither Fisher nor Michail explicitly discloses that the trapezoids are completely represented by triangles, since Michail teaches that just a portion of each trapezoid is represented by a triangle. Obata, however, discloses a polygon division method that fully represents each trapezoid as two triangles (fig. 17; col. 2, line 67-col. 3, line 23). The motivation for this is to use polygons of the simplest construction to enable filling of and display of polygons at high speed (col. 1, lines 11-21). It would have been obvious to one skilled in the art to modify Fisher and Michail to completely divide trapezoids into triangles in order to increase speeds as taught by Obata.

None of the above 3 references explicitly discloses mapping texture using perspective correction. Ikedo, however, discloses a method of using a reverse

projection transformation to correct perspective in bump-mapping (col. 5, lines 33-58), a type of texture mapping. The reference further states that this is desirable when angles are defined in device coordinates. It is further noted that the instant application also uses a similar method to correct perspective, using reverse mapping to correct perspective distortion (see section 0017 of applicant's specification). It would have been obvious to modify the above 3 references to correct perspective in order to allow compatibility with different coordinate systems as taught by Ikedo.

5.   As to claim 14, Michail teaches a Gouraud shading technique for reducing line anti-aliasing in a polygon (see Abstract and sections 0061-0065 and 0069-0070; a texture is anti-aliased by both row and column, meaning a "line profile" has been applied to both). It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Fisher in view of Michail to include anti-aliasing because such a process improves the visual appearance and resolution of presented graphics.

6.   As to claim 17, none of Fisher, Michail, and Obata explicitly discloses applying a reverse perspective view transformation to textures. Ikedo, however, discloses, in col. 5, lines 45-51, that a reverse perspective view transformation is desirable when angles are defined in device coordinates, and motivation for the combination is given in the rejection to claim 13.

7.   As to claim 18, Fisher discloses a method in which a column of texels corresponds to a single radial (col. 6, lines 36-44) and in which a radial is bound spatially by trapezoid upper and lower chords (col. 2, line 65-col. 3, line 5; col. 5, lines

45-65; col. 6, lines 36-45; fig. 4e; radials are bound into range bins which are bounded by the top and bottom of a trapezoid).

8.   As to claim 19, Fisher discloses selecting a texture from a number of textures based on radius size and line width of an arc (col. 7, lines 3-55; textures are stored in memory differently based on number of range bins and angles, which correspond to radius size and line width; col. 8, lines 26-50 then discloses looking up *corresponding* textures, meaning that those corresponding to large number of range bin/large angle will be selected differently from those corresponding to small number of range bin/small angle).

9.   As to claim 20, Fisher teaches that textures are rectangular and that mapping occurs along a radial bounded by the top and bottom of the assigned range bin (col. 2, line 65-col. 3, line 5; col. 5, lines 45-65; col. 6, lines 36-45; col. 7, lines 15-20; col. 8, lines 40-50).

10.   As to claim 51, Ikedo discloses a mapping step including a reverse mapping of the perspective correction (col. 5, lines 45-51; reverse projection is applied to correct distortion). Motivation for the combination is given in the rejection to claim 13.

11.   Claim 15 is rejected under 35 USC 103(a) as unpatentable over Fisher in view of Michail, Obata, and Ikedo as applied to claim 13 above, and further in view of Richens (U.S. Patent 6,226,000)

12.   As to claim 15, Michail further discloses different shading and colors applied to the edge line profile of the triangles (sections 0069-0070), but none of Fisher, Michail, and Obata explicitly discloses a texel column that transitions from dark to light to dark.

Richens, however, discloses the alpha value, or transparency value, of a texel column

varying sinusoidally, from opaque to transparent to opaque (fig. 26; col. 24, lines 18-32).

Note that the effect of this is shown in fig. 25, with dark lines between patches of light in

a texel column. The motivation for this is to apply hatching of variable density (col. 25,

lines 5-17) and offer assistance to a user in CAD programming (col. 1, lines 34-57). It

would have been obvious to one skilled in the art to modify Fisher, Michail, and Obata to

transition a texel column from dark to light to dark in order to allow a user to improve

upon a scene as taught by Richens.

13.   Claim 16 is rejected under 35 USC 103(a) as unpatentable over Fisher in view of

Michail, Obata, and Ikedo as applied to claim 13 above, and further in view of

Mukoyama (U.S. Publication 2005/0035979).

14.   As to claim 16, none of Fisher, Michail, and Obata explicitly discloses that the

texture is symmetrical about a midline of a trapezoid, but Mukoyama teaches that it is

well known to insert textures in a symmetric manner (sections 0004 and 0019-0022). It

would have been obvious to one of ordinary skill in the art to modify Fisher, Michail, and

Obata to insert textures in this manner to assure that such objects appear to be the

most realistic and that radial mapping is easier (sections 0004 and 0019-0022).

Allowable Subject Matter

15.   Claim 50 is objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

16.   The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose a method wherein "a final trapezoid required to complete the arc is a fraction of the full trapezoids, and wherein standard texture is used for the final trapezoid and wherein adjusted perspective texture coordinates are used to draw a final segment without distortion" along with the other limitations of claims 13 and 50. The prior art discloses splitting an arc into trapezoids as noted above, but does not disclose a fractional size trapezoid. While one could argue that it would be obvious to complete an arc with a smaller trapezoid if necessary, since the prior art does not disclose how one would correctly transform such a trapezoid, one would not have been able to apply adjusted perspective texture coordinates without distortion to such a trapezoid without using hindsight into applicant's disclosure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON M. RICHER whose telephone number is (571)272-7790. The examiner can normally be reached on weekdays from 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron M Richer/
Primary Examiner, Art Unit 2628
6/11/08